PASSENGER PIGEON

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THE PROGRESS OF SCIENCE

PROFESSOR EINSTEIN'S VISIT TO THE UNITED STATES

Plans have been under consideration for lectures by Professor Einstein in the United States, but his arrival at the beginning of April on a mission to promote the Zionist movement was a surprise. He is accompanied by Professor Chaim Weizmann, director of the chemical research laboratories of the British Admiralty during the war, now head of the World Zionist Organization, and two other leaders in the movement. Professor Einstein is reported to be especially interested in the establishment of a University of Jerusalem and to be ready to take part in its work, but it is not likely that he will leave Berlin permanently. Professor Bergson has denied the report that he would leave Paris to become professor at Jerusalem.

Arrangements were promptly made for scientific lectures by Professor Einstein at several universities, the first being appropriately given at Columbia University, which awarded to him last year the Barnard Medal on the recommendation of the National Academy of Sciences. Four lectures have been given at the College of the City of New York and a series of five lectures is announced to be given at Princeton University from May 9 to 13. Scientific men are invited to attend the Princeton lectures; those wishing to do so should write to Professor H. A. Thompson.

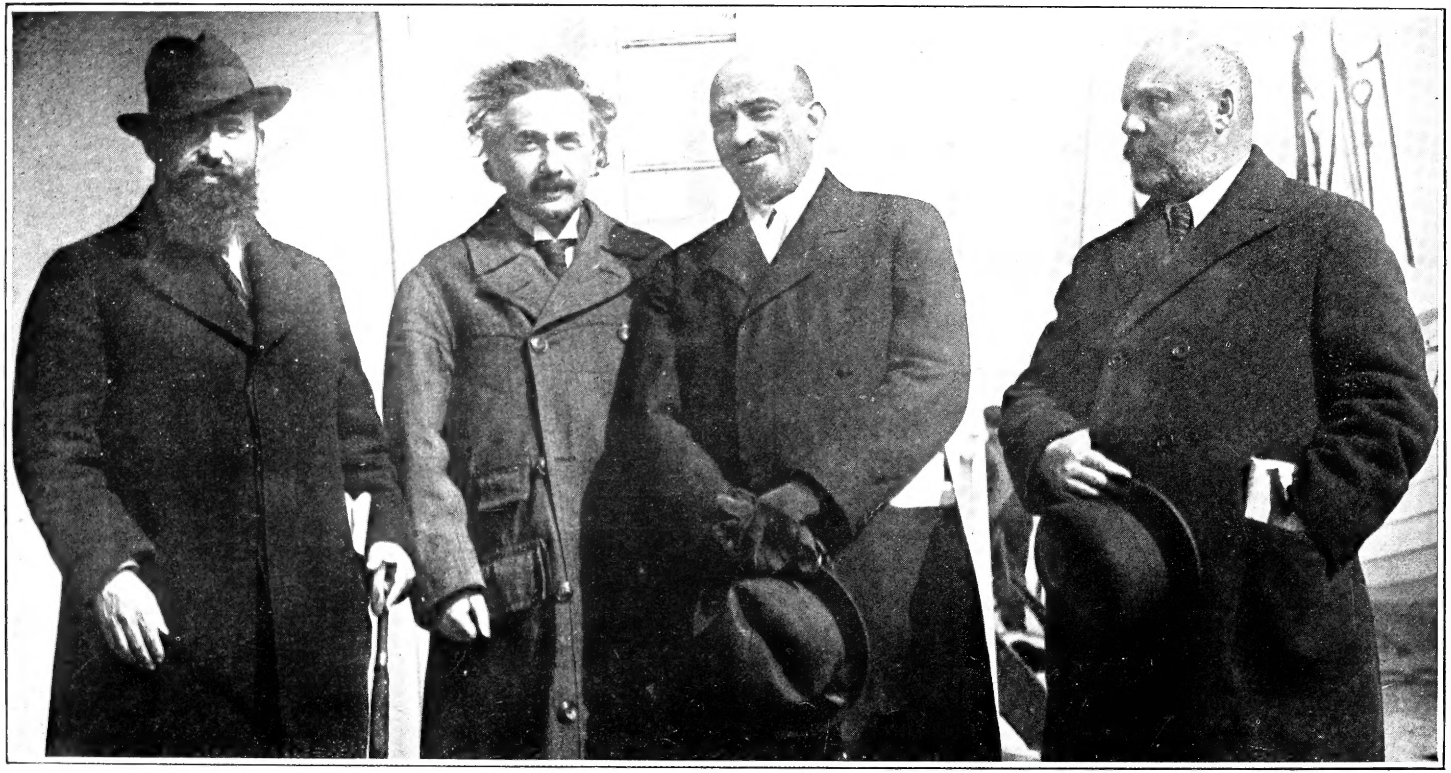
It is satisfactory that there should be such widespread popular interest in Professor Einstein and his work. In the article on the History of Mathematics by Professor Ernest Brown in the present issue of the MONTHLY and in the article on the History of Physics by the late Professor Andrews Henry Bumstead in the last issue will be found statements of Professor Einstein's contributions in their historic continuity. An article on the Theory of Relativity by Professor E. B. Wilson was printed in the issue of the MONTHLY for March, 1920. In the issue of *Nature* for February 17 last will be found a series of articles on all aspects of the theory of relativity. Professor Einstein himself contributes an article on the development of his theory in which he writes:

The development of the special theory of relativity consists of two main steps, namely the adaptation of the space-time "metrics" to Maxwell's electro-dynamics, and an adaptation of the rest of physics to that altered space-time "metrics." The first of these processes yields the relativity of simultaneity, the influence of motion on measuring-rods and clocks, a modification of kinematics, and in particular a new theorem of addition of velocities. The second process supplies us with a modification of Newton's law of motion for large velocities, together with information of fundamental importance on the nature of inertial mass.

It was found that inertia is not a fundamental property of matter, nor, indeed, an irreducible magnitude, but a property of energy. If an amount of energy E be given to a body, the inertial mass of the body increases by an amount E/c^2, where c is the velocity of light *in vacuo*. On the other hand, a body of mass m is to be regarded as a store of energy of magnitude mc^2.

Furthermore, it was soon found impossible to link up the science of gravitation with the special theory of relativity in a natural manner. In this connection I was struck by the fact that the force of gravitation possesses a fundamental property, which distinguishes it from electro-magnetic forces. All bodies fall in a gravitational field with the same acceleration, or—what is only another formulation of the same fact—the gravitational and inertial masses of a body are numerically equal to each other. This numerical equality suggests identity in character. Can gravitation and inertia be identical? This question leads directly to the General Theory of Relativity. Is it not pos-

PROFESSOR ALBERT EINSTEIN



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LEADERS OF THE WORLD ZIONIST ORGANIZATION ON THEIR ARRIVAL AT NEW YORK

PRINCIPAL MOSSINSON PROFESSOR EINSTEIN DR. WEIZMANN DR. USSISHKIN

sible for me to regard the earth as free from rotation, if I conceive of the centrifugal force, which acts on all bodies at rest relatively to the earth, as being a "real" field of gravitation, or part of such a field? If this idea can be carried out, then we shall have proved in very truth the identity of gravitation and inertia. For the same property which is regarded as *inertia* from the point of view of a system not taking part in the rotation can be interpreted as *gravitation* when considered with respect to a system that shares the rotation. According to Newton, this interpretation is impossible, because by Newton's law the centrifugal field can not be regarded as being produced by matter, and because in Newton's theory there is no place for a "real" field of the "Koriolis-field" type. But perhaps Newton's law of field could be replaced by another that fits in with the field which holds with respect to a "rotating" system of coordinates? My conviction of the identity of inertial and gravitational mass aroused within me the feeling of absolute confidence in the correctness of this interpretation. In this connection I gained encouragement from the following idea. We are familiar with the "apparent" fields which are valid relatively to systems of coordinates possessing arbitrary motion with respect to an inertial system. With the aid of these special fields we should be able to study the law which is satisfied in general by gravitational fields.

A NEWS SERVICE FOR SCIENCE

Science Service is the name of an agency newly established in Washington for the diffusion of knowledge. It is generously supported by Mr. E. W. Scripps and will be a corporation conducted without profit, all receipts being used for the work and its extension.

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DR. ERNEST FOX NICHOLS
PRESIDENT OF THE MASSACHUSETTS INSTITUTE OF TECHNOLOGY

composed of five members, one selected from each group of trustees from the different organizations represented on the board. The present members of the committee are the president and vice-president of the board, Dr. J. McKeen Cattell and Dr. J. C. Merriam. A member from the journalistic group is yet to be selected.

As editor the board of trustees has selected Edwin E. Slosson, Ph.D., who for twelve years was professor of chemistry in the University of Wyoming and for seventeen years literary editor of *The Independent*, New York. He has been associate in the Columbia School of Journalism since its foundation and is the author of "Creative Chemistry," "Easy Lessons in Einstein," and other scientific and literary publications.

As manager of the new enterprise the board has selected Howard Wheeler, formerly editor of the San Francisco *Daily News*, Pacific coast manager of the Newspaper Enterprise Association, managing editor of *Harpers Weekly*, and for five years editor of *Everybody's Magazine*.

The headquarters of Science Service have been provisionally established in the building of the National Research Council, at 1701 Massachusetts Avenue, Washington, D. C.

THE MASSACHUSETTS INSTITUTE OF TECHNOLOGY AND PRESIDENT NICHOLS

The election of Dr. Ernest Fox Nichols. as president of the Massachusetts Institute of Technology, was announced by the corporation on March 30. Dr. Nichols succeeds the late Dr. Richard C. Maclaurin, also a distinguished physicist, under whose administration the institute moved to its new buildings and made notable progress in its educational work.

For the last twelve months Dr. Nichols has been director of physical research at the Nela Park Laboratory of the National Electric Lamp Association, Cleveland. He was born in 1869 at Leavenworth, Kansas, graduated from the Kansas Agricultural College and received from Cornell University the degree of doctor of science in 1897. In 1892 Dr. Nichols was appointed to the chair of physics and astronomy at Colgate University, where he remained for six years. More than two years of this time, however, was spent on leave of absence during which he studied at the University of Berlin. There he discovered the metallic reflection of quartz and its anomalous dispersion in the infra-red spectrum, which led to a new method of spectrum analysis by which the spectrum was extended to six times the previous limits. Rubens, Wood and von Bayer were thus enabled to make a further extension, detecting heat waves 1/64 inch in length.

In 1898 Dr. Nichols was called to the professorship of physics in Dartmouth College, where he made the first measurements of the heat received from several of the brighter stars and planets, by using a radiometer of his own invention, and with Dr. Hull, in 1901, discovered the pressure of a beam of light which had been predicted by Maxwell. Simultaneously the Russian physicist, Lebedev, was able to detect this pressure, but unable to measure it.

After five years at Dartmouth, Dr. Nichols was called to the chair of experimental physics in Columbia University. The year 1904-05 Dr. Nichols spent at Cambridge, England, and lectured at the Royal Institution in London and the Cavendish Laboratory of Cambridge University. He remained at Columbia until 1909, when he was called to the presidency of Dartmouth, resigning in 1916 to become professor of physics at Yale University. This latter position he held until 1920, but during the war he was associated with the Bureau of Ordnance of the Navy Department.

SCIENTIFIC ITEMS

We record with regret the death of John Burroughs, the distinguished naturalist; of Henry P. Cushing, professor of geology in Western Reserve University, and of Louis Compton Miall, the English biologist.

The annual meeting of the American Philosophical Society at Philadelphia and of the National Academy of Sciences at Washington were held toward the end of April. The evening lecture before the American Philosophical Society was given by Professor James H. Breasted, of the University of Chicago, whose series of lectures on "The Origins of Civilization" were recently printed in this journal. Prince Albert of Monaco gave the evening address before the National Academy of Sciences, and its Alexander Agassiz gold medal was conferred on him in recognition of his promotion of oceanographic research.

The Albert medal of the Royal Society of Arts has been presented to Professor Albert Michelson, for his discovery of a natural constant which has provided a basis for a standard of length. The award was made last year, but the actual presentation was deferred until Professor Michelson could go to England to receive it.

Dr. William Crocker, associate professor of botany in the University of Chicago, has been appointed director of the newly founded Thompson Institute for Plant Research at Yonkers, New York. He will enter on his work next autumn. The board of trustees of the new foundation will consist of three business men and three scientific men. Professor John M. Coulter, head of the department of botany at the University of Chicago, and Raymond F. Bacon, of the Mellon Institute of Pittsburgh, will be two of the scientific men, and these two will select the third.

From Punch.

NEWTON AND THE RELIC HUNTER: AN APPLE NOT A STONE

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